



*ELECTRICAL POWER ENGINEERING*

Department of Electrical Power Engineering

**Postgraduate Research Template**

#	<b>Student Name / Surname</b>	Abayomi Aduragba Adebisi	<b>Start Date</b>	February 2018	<b>Supervisor</b>	Professor Ian Lazarus
	<b>Title of Project</b>	Performance Analysis and Optimization of Distribution Grid-tied Photovoltaic System	<b>Completion</b>	April 2021	<b>Co-Supervisor(s)</b>	Dr. A.K Saha Dr. Evans E. Ojo
<b>Program of Study (M Eng. / D Eng.)</b>			D Eng.			
	<b>Student #</b>	21556780	<b>Email Address</b>		21556780@dut4life.ac.za	
<p><b>Synopsis of Research Project: (&lt; 300 words)</b>          Currently in our world, about 80% of our energy are sourced from fossil fuels. The conversion of these fuels into energy increases greenhouse gases and pollutants. Consequently, our environment and delicate ecosystem are threatened. To avert the global warming disaster, the global warming has to be kept to less than 1.5 centigrade degree above pre-industrial temperatures. For this target, the global greenhouse gas emissions should be reduced, and by 2050, these emissions should be reduced worldwide by 80% from their 1990 levels. Presently, the world annual energy consumption is 10 terawatts (TW) and by 2050 this amount will be about 30 TW. The world will need about 20 TW of non-CO<sub>2</sub> energy to stabilize CO<sub>2</sub> in the atmosphere by 2050. The simplest scenario to achieve this feat by mid-century is to deploy renewable sources to generate energy. The need for the sustainable development of electricity, energy efficiency improvement, and environment pollution reduction has favored the development of Photovoltaic (PV) system, but problems come with increasing PV penetration in distribution networks. This research work will investigate and develop a new optimization technique to reduce the impact of large penetration of photovoltaic (PV) generation on distribution network. The overall approach to be taken in this research is to develop a model and investigate the behaviour of the Photovoltaic (PV) generation on the distribution grid applying a new method, modified Perturb and Observe (modified P &amp; O) algorithm, to analyse the response of the grid to various level of penetration of PV generation and to explain the observations from the working principle of the PV generation types and the characteristics of their interaction with the power system. This proposed research will explore past related literatures and develop an analytical concept to be use in in MATLAB/Simulink®.</p>						